

AMENDMENTS TO THE CLAIMS

Claims 1-45 (Canceled)

46. (New) A magnetic recording medium having at least a magnetically anisotropic recording film on a disk substrate,

comprising a lubricating layer over at least the recording film, with a protective layer having a lower thermal conductivity than the recording film being interposed therebetween.

47. (New) The magnetic recording medium according to Claim 46, wherein the protective layer has a thermal conductivity of 1×10^6 erg/(s·K·cm) or less.

48. (New) The magnetic recording medium according to Claim 46, wherein the protective layer comprises a plurality of thin films.

49. (New) The magnetic recording medium according to Claim 48, wherein the plurality of thin films each have a different thermal conductivity.

50. (New) The magnetic recording medium according to Claim 49, wherein the protective layer comprising a plurality of thin films is formed such that the thermal conductivity of the thin film on the recording film side is higher than the thermal conductivity of the thin film on the lubricating layer side.

51. (New) The magnetic recording medium according to Claim 49, wherein the protective layer comprising a plurality of thin films has at least a thin film whose thermal conductivity is 1×10^6 erg/(s·K·cm) or less.

52. (New) The magnetic recording medium according to Claim 46, wherein the main component of the protective layer is carbon.

53. (New) The magnetic recording medium according to Claim 52, wherein the protective layer includes diamond-like carbon.

54. (New) The magnetic recording medium according to Claim 53, wherein the protective layer includes nitrogen, oxygen, or hydrogen.

55. (New) The magnetic recording medium according to Claim 54, wherein the nitrogen, oxygen, or hydrogen content is varied within the plurality of thin films of the protective layer.

56. (New) The magnetic recording medium according to Claim 46, wherein the protective layer includes a material having heat resistance at a temperature of at least 250°C.

57. (New) The magnetic recording medium according to Claim 56, wherein the heat resistant material is composed of a fluororesin or a ceramic material.

58. (New) The magnetic recording medium according to Claim 56, wherein the heat resistant material is composed of Teflon®.

59. (New) The magnetic recording medium according to Claim 46, wherein the protective layer includes a metal material.

60. (New) The magnetic recording medium according to Claim 59, wherein the metal material is composed of titanium, tantalum, and chromium.

61. (New) The magnetic recording medium according to Claim 59, wherein the metal material is composed of a nitrogen compound or an oxide.

62. (New) The magnetic recording medium according to Claim 46, wherein the protective layer includes at least a chalcogen compound.

63. (New) The magnetic recording medium according to Claim 46, wherein the lubricating layer comprises a plurality of thin films.

64. (New) The magnetic recording medium according to Claim 63, wherein the plurality of thin films each have a different thermal conductivity.

65. (New) The magnetic recording medium according to Claim 63, wherein the lubricating layer includes PFPE.

66. (New) The magnetic recording medium according to Claim 63, wherein the lubricating layer includes a heat resistant material.

67. (New) The magnetic recording medium according to Claim 63, wherein the lubricating layer includes an oxide or a nitride.

68. (New) The magnetic recording medium according to Claim 46, wherein the combined thickness of the lubricating layer and the protective layer is at least 1 nm and no more than 100 nm.

69. (New) The magnetic recording medium according to Claim 68, wherein the thickness of the lubricating layer is at least 0.5 nm and no more than 20 nm.

70. (New) The magnetic recording medium according to Claim 68, wherein the thickness of the protective layer is at least 0.5 nm and no more than 99.5 nm.

71. (New) The magnetic recording medium according to Claim 46, wherein the recording film includes a magnetic layer having magnetic anisotropy in the direction perpendicular to the film plane.

72. (New) The magnetic recording medium according to Claim 46, wherein the recording film comprises a plurality of magnetic layers.

73. (New) The magnetic recording medium according to Claim 72, wherein the recording film comprises at least a recording layer, an intermediate layer, and a reproduction layer, which are laminated over one another.

74. (New) The magnetic recording medium according to Claim 73, wherein the recording domain formed on the recording layer in the recording film is transferred to the reproduction layer, and recorded information is reproduced by domain wall displacement in the reproduction layer.

75. (New) The magnetic recording medium according to Claim 73, wherein the recording layer includes at least terbium, iron, and cobalt.

76. (New) The magnetic recording medium according to Claim 73, wherein the recording layer is laminated intermittently and periodically for each layer of different material or compositional ratio.

77. (New) The magnetic recording medium according to Claim 46, wherein a pit-shaped pattern is formed on the disk substrate according to the pattern of the recording domain formed in the recording layer.

78. (New) The magnetic recording medium according to Claim 77, wherein a pit-shaped pattern that is smaller than the smallest pattern of the recording domain formed in the recording layer is formed on the disk substrate.

79. (New) The magnetic recording medium according to Claim 77, wherein at least a metal layer with a high thermal conductivity is provided between the disk substrate and the recording film.

80. (New) The magnetic recording medium according to Claim 79, wherein a dielectric layer is provided between the recording film and the metal layer.

81. (New) The magnetic recording medium according to Claim 79, wherein a dielectric layer is provided between the disk substrate and the metal layer.

82. (New) The magnetic recording medium according to Claim 79, wherein at least the metal layer or the dielectric layer has an etched surface.

83. (New) The magnetic recording medium according to Claim 82, wherein at least the metal layer or the dielectric layer has a surface roughness Ra of at least 0.5 nm.

84. (New) The magnetic recording medium according to Claim 80, wherein the dielectric layer includes at least a chalcogen compound.

85. (New) A method for manufacturing a magnetic recording medium having at least a magnetically anisotropic recording film on a disk substrate, comprising:

forming at least a magnetically anisotropic recording film on a disk substrate;
style="padding-left: 40px;">forming a protective layer having a lower thermal conductivity than the recording film over the recording film; and
style="padding-left: 40px;">forming a lubricating layer over the protective layer.

86. (New) The method for manufacturing a magnetic recording medium comprising according to Claim 85, wherein the lubricating layer is formed in a vacuum.

87. (New) The method for manufacturing a magnetic recording medium comprising according to Claim 86, wherein the lubricating layer is formed by coating after the protective layer has been formed.

88. (New) An apparatus for manufacturing a magnetic recording medium having at least a magnetically anisotropic recording film on a disk substrate, the apparatus comprising:

a recording film formation unit for forming at least a magnetically anisotropic recording film on a disk substrate;

a protective layer formation unit for forming a protective layer having a lower thermal conductivity than the recording film over the recording film; and

a lubricating layer formation unit for forming a lubricating layer over the protective layer.

89. (New) A method for recording to or reproducing from a magnetic recording medium having at least a magnetically anisotropic recording film on a disk substrate,

wherein information is recorded to or reproduced from the magnetic recording medium by applying a laser beam to the magnetic recording medium according to Claim 46 to raise the temperature of the recording film of the recording medium.

90. (New) An apparatus for recording to or reproducing from a magnetic recording medium having at least a magnetically anisotropic recording film on a disk substrate, comprising:

a heating unit for raising the temperature of the magnetic recording medium according to Claim 46; and

a recording and reproduction unit for magnetically recording and reproducing signals to and from the magnetic recording medium when the heating unit raises the temperature of the magnetic recording medium,

wherein the temperature distribution in the signal region of the magnetic recording medium during signal recording to the magnetic recording medium is different from that during signal reproduction.